Appendix B: Merced Wild and Scenic River Section 7 Determination

Introduction

Purpose of this Determination

The purpose of this determination is to evaluate the impact of the proposed Cascades Diversion Dam Removal Project on the free-flowing condition and the Outstandingly Remarkable Values for which the Merced River was designated Wild and Scenic.

Authority

The authority for this determination is found in Section 7(a) of the Wild and Scenic Rivers Act (Public Law 90-542, as amended, 16 United States Code 1271-1278). Section 7(a) states:

> …no department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.

While the Wild and Scenic Rivers Act does not prohibit development along a river corridor, it does specify guidelines for the determination of appropriate actions within the bed and banks of a Wild and Scenic River. As the designated river manager for the Merced River segments located within the boundaries of Yosemite National Park and the El Portal Administrative Site, the National Park Service must carry out a Section 7 determination on all proposed water resources projects[1] to ensure they do not directly and adversely impact the free-flowing condition or the values for which the river was designated.[2]

Wild and Scenic River Designation

In 1987, the U.S. Congress designated the Merced River a "Wild and Scenic River" to protect the river's free-flowing condition and to protect and enhance its unique values for the benefit and enjoyment of present and future generations (16 United States Code 1271). This designation gives the Merced River special protection under the Wild and Scenic Rivers Act.

The passage of Public Law 100-149 on November 2, 1987 and Public Law 102-432 on October 23, 1992 placed 122 miles of the main stem and South Fork of the Merced River, including the forks of Red Peak, Merced Peak, Triple Peak, and Lyell, into the Wild and Scenic River System. The

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[1] A water resources project is any dam, water conduit, reservoir, powerhouse, transmission line, or other works project under the Federal Power Act, or other developments, that would affect the free-flowing characteristics of a wild and scenic or congressionally authorized study river. In addition to projects licensed by the Federal Energy Regulatory Commission, water resources project may include: dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction projects, bank stabilization projects, channelization projects, levee construction, boat ramps, fishing piers, and activities that require a Section 404 permit from the U.S. Army Corps of Engineers (Interagency Wild and Scenic Rivers Coordinating Council 1999).

[2] This description of the Wild and Scenic Rivers Act Section 7 determination process is adapted from a technical report by the Interagency Wild and Scenic Rivers Coordinating Council (Interagency Wild and Scenic Rivers Coordinating Council 1999).

National Park Service manages 81 miles of the Merced Wild and Scenic River, encompassing both the main stem and the South Fork in Yosemite National Park and the El Portal Administrative Site. The U.S. Forest Service and the Bureau of Land Management administer the remaining 41 miles of the designated river.

Methodology

Wild and Scenic Rivers Act Section 7 Determination

The Section 7 evaluation for the Cascades Diversion Dam Removal Project is based on guidance provided in the *Wild and Scenic Rivers Act: Section 7 Technical Report*, *Appendix C, Evaluation Procedure under "Direct and Adverse"* (Interagency Wild and Scenic Rivers Coordinating Council 1999). The "direct and adverse" evaluation procedure is carried out for water resources projects licensed by the Federal Energy Regulatory Commission or other federally assisted water resources projects within the Wild and Scenic River boundary of the designated river. Cascades Diversion Dam is within the bed and banks of the Merced River. All proposed activities would occur within the Wild and Scenic boundary of the Merced River. The Section 7 determination process applies only to the proposed action.

Protection and Enhancement of Outstandingly Remarkable Values

Section 7 of the Wild and Scenic Rivers Act requires river managing agencies to determine whether water resources projects would adversely affect free flow or directly and adversely impact Outstandingly Remarkable Values. In addition, Section 10(a) of the act requires that rivers be administered to protect and enhance Outstandingly Remarkable Values. Outstandingly Remarkable Values are the river-related values that make the river segment unique and worthy of special protection. Uses that are consistent with this provision and that do not substantially interfere with public enjoyment and use of these values should not be limited (16 United States Code 1281[a]). Outstandingly Remarkable Values located outside the Wild and Scenic River corridor boundary must also be protected (NPS 2001a).

The Merced Wild and Scenic River segments applicable to the Cascades Diversion Dam Removal Project are 3A (Impoundment), 3B (Gorge), and 4 (El Portal). For the purposes of this analysis of potential effects on Outstandingly Remarkable Values, the proposed action is compared to the No Action Alternative (see Chapter II, Alternatives). The focus of the analysis is on long-term effects (e.g., effects that would last 10 years or more or would be permanent). Short-term effects are not addressed in this analysis unless they are of sufficient magnitude (having a substantial, highly noticeable influence) to warrant consideration.

Analysis of Outstandingly Remarkable Values is focused on segment-wide effects, rather than site-specific or localized effects. Exceptions to the segment-wide guideline include site-specific activities that could have substantial effects on Outstandingly Remarkable Values, such as degradation of habitat of a river-related special-status species (a biological Outstandingly Remarkable Value) that is endemic to that location. For the Cascades Diversion Dam Removal Project, Outstandingly Remarkable Values are evaluated based on effects to such values within the Impoundment, Gorge, and El Portal segments of the Merced Wild and Scenic River.

In terms of evaluating potential effects, actions that could degrade Outstandingly Remarkable Values on a segment-wide basis include actions with effects that would be discernible throughout the majority of the river segments, or would be of sufficient magnitude to affect adjacent segments.

For the purposes of this analysis under Sections 7 and 10 of the act, the following assumptions for each Outstandingly Remarkable Value were made:

Scientific: The analysis considers whether the proposed action would affect the integrity of the Merced Wild and Scenic River as a scientific resource, or would degrade the river's value for research (all segments).

Scenic: The analysis considers the specific features that are listed in the scenic Outstandingly Remarkable Value for the Gorge segment and potential effects to views are analyzed from the perspective of a person situated on the riverbank or on the river (Gorge segment).

Geologic Processes/Conditions: The analysis gives primary consideration to designated processes and those processes (e.g., U -shaped valley, hanging valleys, evidence of glaciation, etc.) that have been responsible for creating the river's geologic landscape. Effects related to natural meandering of the Merced River are addressed in the hydrologic processes Outstandingly Remarkable Value (all segments).

Recreation: The analysis considers whether opportunities to experience a spectrum of river-related recreational activities would be affected (Gorge and El Portal segments).

Biological: The analysis focuses on effects to riparian areas, wetlands, and other riverine areas that provide rich habitat for a diversity of river-related species (all segments).

Cultural: The analysis considers effects to river-related cultural resources that are not intended to divert the free flow of the river and are either eligible for or listed on the National Register of Historic Places, including archeological sites, which provide evidence of thousands of years of human occupation and current traditional use sites. The analysis also considers effects on nationally significant historic resources, such as designed landscapes and developed areas, historic buildings, and circulation systems (trails, roads, and bridges) that provide visitor access to the sublime views of natural features that are culturally valuable (Gorge and El Portal segments).

Hydrologic Processes: Consideration is primarily given to designated processes, such as river meandering, world-renowned waterfalls, an active flood regime, oxbows, and fluvial processes. Effects on wetlands are addressed in the biological Outstandingly Remarkable Value (Gorge and El Portal segments).

It is possible for Outstandingly Remarkable Values to be in conflict with each other, or for an action to have beneficial impacts with regard to one Outstandingly Remarkable Value and adverse impacts with regard to other Outstandingly Remarkable Values. The Merced River Plan recognizes this possibility, and states (page 32):

> Actions must protect all Outstandingly Remarkable Values, regardless of where they are located. When Outstandingly Remarkable Values lie within the boundary of the Wild and Scenic River, the value must be protected and enhanced. When values are in conflict with each other, the net effect to Outstandingly Remarkable Values must be beneficial.

The Wild and Scenic Rivers Act stipulates that agencies are given discretion to manage a river system with "varying degrees of intensity for its protection and development, based on the special attributes of the area." For example, there may be conflicts between protecting cultural resources and hydrologic processes, as is the case with a historic bridge that constricts the flow of the river.

Compatibility with Classifications

The Cascades Diversion Dam Removal Project was assessed for its compatibility with the Merced Wild and Scenic River recreational and scenic classifications.

Consistency with the River Protection Overlay

The Cascades Diversion Dam Removal Project was assessed for its consistency with the River Protection Overlay prescriptions. The River Protection Overlay includes the Merced Wild and Scenic River channel itself, and extends 150 feet on both sides of the river, measured from the ordinary high-water mark above the Cascades Powerhouse and 100 feet on both sides of the river, measured from the ordinary high-water mark below the Cascades Powerhouse.

Consistency with Management Zoning

The Cascades Diversion Dam Removal Project was assessed for its consistency with the Merced River Plan management zoning and the corresponding zoning prescriptions. The management zones applicable to the Cascades Diversion Dam Removal Project include:

- Discovery (2B) north of the river in the Impoundment segment
- Open Space (2A) south of the river in the Impoundment segment

Cascades Diversion Dam Removal Project Wild and Scenic Rivers Act Section 7 Determination

Table B-1 presents the Section 7 evaluation for the Cascades Diversion Dam Removal Project.

Table B-1
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
DEFINE THE PROPOSED ACTIVITY	
Project proponent	National Park Service, Yosemite National Park
Purpose and need for the project	The purpose of the Cascades Diversion Dam Removal Project is to remove an unnatural obstruction on the Merced River and to restore the river's natural free-flowing condition. This removal project is consistent with the Wild and Scenic River guidance provided in the Merced River Plan and will meet the direction of the *Yosemite Valley Plan*, which calls for the dam's removal. The Cascades Diversion Dam is classified as a high hazard structure (USBR 1997). It is in unsatisfactory condition due to flood damage experienced in 1997 and continuing deterioration associated with age. In addition, the dam no longer serves a useful purpose – water is not diverted from the site to generate electricity or for other uses, and the impoundment does not regulate high water. Removal of the existing dam structure is necessary to prevent possible uncontrolled and sudden failure, which could result in a release of impounded water and the deposition of concrete and timber debris, grouted rockfill, and impounded sediment along the downstream channel. Such an occurrence could pose a considerable threat to valued resources (such as aquatic life, scenic views, and recreational opportunities), infrastructure (El Portal Road, wastewater, telephone, and electrical lines), and human life. In addition, the National Park Service is entrusted to conserve and restore park values. This includes protecting the biological and physical processes that created the park, along with scenic features, natural landscapes, and native plants and wildlife. The removal of the dam would work toward fulfilling this mandate by restoring this segment of the Merced River.
Geographic location of the project	Cascades Diversion Dam is located on the main stem of the Merced River in Yosemite National Park, near the intersection of El Portal Road and Big Oak Flat Road (UTM coordinates 11 263647E 4177777N, approximately river mile 120). Refer to figures I-1 and II-1 of the Cascades Diversion Dam Removal Project Environmental Assessment.
Project description	The proposed action includes complete removal of the dam, the dam abutments, the intake structure, and the screenhouse, and restoration of the related river channel located beneath the dam site. Sediment (including rocks and boulders) in the area upstream of the dam would be excavated and repositioned to stabilize the river-right bank and decrease the potential for sediment erosion. Natural river processes would continue to transport remaining sediments (up to a maximum range of approximately 9,600 to 15,600 cubic yards of sediment) from the impoundment area over time, allowing for a gradual re-establishment of the natural river channel and related riparian habitat. It is expected that the river would fully recover incrementally over time as sediments are transported from the impoundment area. Following removal of the river-right abutment, intake structure and screenhouse, the river-right bank would be stabilized using a bioengineered bank stabilization system to prevent erosion of the river-right bank. The objective of this alternative would be to restore the natural river character with a mixture and distribution of boulders, cobbles, gravels, sand, silt, soil, and vegetation similar to those found in adjacent river bank segments. Refer to the description of the preferred alternative (Alternative 2) in the Cascades Diversion Dam Removal Project Environmental Assessment. Upon project completion, the river segment through the damsite would be restored to natural conditions and reclassified from recreational to scenic.

Table B-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Duration of the proposed activities	In-channel work, bank stabilization, and revegetation would be completed within a two- to three-month period during the fall of 2003 (September through November) when the flow of the Merced River is typically lowest (less than 200 cubic feet per second). The overall project duration would be approximately five months. Natural transport of up to approximately 9,600 to 15,600 cubic yards of impounded sediment (including rocks/bounders) could be transported with high riverflows during the winter or spring of 2004.
Magnitude and/or extent of the proposed activities	Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter IV, Environmental Consequences for detailed data concerning potential impacts of the proposed action.
Mitigation	The proposed action is designed to restore free-flow and natural fluvial processes of the Merced River. The proposed action would protect Outstandingly Remarkable Values from possible damage due to continued degradation and eventual failure of the dam, improve the free-flowing condition of the river, and restore natural fluvial processes in the vicinity of the dam. Mitigation (e.g., best management practices and resource-specific measures) is incorporated into the proposed action. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives for mitigation measures incorporated into the proposed action.
Relationship to past and future management activities	The *Yosemite Valley Plan* calls for removal of the Cascades Diversion Dam. The Cascades Diversion Dam Removal Project is consistent with the Wild and Scenic River guidance provided in the Merced River Plan. Implementation of the proposed action would alter management of this river segment from an unnatural impoundment to management of a free-flowing river segment.
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER WITHIN-CHANNEL CONDITIONS	
The position of the proposed activity relative to the streambed and streambanks	Cascades Diversion Dam is located within the bed and banks of the Merced River. Dam removal activities would occur within the bed and banks of the Merced River as well.
Any likely resulting changes in:	
Active channel location	Removal of the Cascades Diversion Dam will eliminate an existing human-made structure that affects the natural flow of the Merced River. Currently, the impoundment created by the dam has unnaturally widened the channel of the Merced River to approximately twice its natural width. Once the dam is removed, the channel of the Merced River would be expected to naturally narrow and deepen immediately upstream of the dam as impounded sediments, including rocks/boulders (up to approximately 9,600 to 15,600 cubic yards), wash downstream. A more natural channel configuration within the bed and banks of the Merced River would result from the proposed action.
Channel geometry (cross-sectional shape, width, depth characteristics)	Once the dam is removed, a portion of remaining sediment (including rocks/boulders) not removed by mechanical means (up to approximately 9,600 to 15,600 cubic yards) would be transported downstream with winter or spring riverflows. Sediment present behind the dam includes a rock and sediment island that was present before the dam was constructed; rock, cobble, and sediments that were excavated during dam construction and left in place upstream of the dam; and sediment that has accumulated since construction of the dam (Kennedy/Jenks 2002). Some of this material would likely remain in the existing impoundment area following dam failure, and it is expected that the island upstream of the dam would remain relatively stable given its presence prior to dam construction.

Table B-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Channel geometry (cross-sectional shape, width, depth characteristics) (cont.)	Sediments are expected to wash downstream within the first year after dam removal (Kennedy/Jenks/Chilton and ROMA Design Group 1988). Sediment transport is expected to be highest in March and April during spring snowmelt. Sediment concentrations are expected to range from 60 milligrams per liter (October through February) to 160 milligrams per liter (spring). Sands and gravels would likely settle out near Cascades Picnic Area. Less than 1% of the material impounded behind the dam is finer than 0.07 millimeter in diameter. The fine material would be transported downstream and would be deposited in areas of low-flow energy, such as pools and downstream reservoirs. The channel of the Merced River would be expected to naturally narrow and deepen as impounded sediments wash downstream. There would be a progressive lowering of the base level of the river channel until the river reach attains equilibrium. Water levels are expected to lower slightly at the upstream end of the impoundment, up to approximately 10 feet in some locations immediately upstream from the existing dam. The island upstream from the dam would likely remain. Local scour would occur at the slope where the diversion dam was located, and is expected to develop into a channel incision that would proceed upstream (headcut) through the impoundment.
Channel slope (rate or nature of vertical drop)	Due to the nature of the material in the channel – primarily boulders, cobbles, and gravels – little or no channel incision is anticipated upstream of the present impoundment. The final bed profile would likely be a smooth slope connecting the reach downstream of the dam to the reach upstream of the dam. The final bed slope in the vicinity of the dam would be approximately 3%.
Channel form (straight, meandering, or braided)	Meander in the reach is anticipated to be minor, since the incision would tend to follow the channel course that existed prior to dam construction in 1917 (Kennedy/Jenks/Chilton and ROMA Design Group 1988; Kennedy/Jenks 2002). Channel adjustment would be episodic, with periods of incision followed by sediment storage and then renewed incision. The channel is expected to stabilize at or near its natural level over a period of years (Kennedy/Jenks/Chilton and ROMA Design Group 1988).
Relevant water quality parameters (turbidity, temperature, nutrient availability)	Because less than 1% of the material is finer than 0.07 millimeter in diameter, turbidity impacts to the river would likely be small and would be mitigated through application of best management practices. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. The largest increase of turbidity above background values (Chapter III, Affected Environment, Alluvial Processes) would likely occur the first time the river flows through the sediments formerly impounded by the dam. This rise in turbidity would probably last on the order of a few hours. After the initial rise in turbidity, there may be smaller spikes in turbidity as flood flows pass through the impoundment region and gradually erode more sediment and expose the fine material. However, each successive turbidity spike should be smaller than the previous one until the turbidity levels return to normal. Water temperature is expected to decrease (compared to existing conditions) immediately upstream of the dam as the channel deepens and riparian vegetation matures. Nutrient availability would be enhanced as the newly established riparian corridor matures.
Navigation of the river	River navigation as defined by the U.S. Army Corps of Engineers is not applicable to this section of the river. Only 20 miles of the Merced River, from its confluence with the San Joaquin River, is designated as navigable by the U.S. Army Corps of Engineers.

Table B-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER RIPARIAN AND/OR FLOODPLAIN CONDITIONS	
The position of the proposed activity relative to the riparian area and floodplain	Cascades Diversion Dam is located within the bed and banks of the Merced River – below ordinary high water and within the 2.33- and 100-year floodplain.
Any likely resulting changes in:	
Vegetation composition, age structure, quantity, or vigor	A portion of the narrow band of existing riparian vegetation along the north (river-right) bank would be affected (e.g., removal, soil compaction) during removal of the dam. At the dam site, the channel would scour to a more natural condition, becoming narrower and deeper. As this occurs, the localized water table is expected to drop, and the existing narrow band of palustrine forests could transition to an upland community. Approximately 4,500 cubic yards of impounded sediment (including rocks/boulders) would be reconfigured on the river-right bank and stabilized with native river rock, consistent with upstream and downstream channel conditions, to provide substrate for riparian restoration. The size, connectivity, and integrity of wetlands in the project area, particularly palustrine forest and riverine habitat, would be enhanced. Palustrine forest would be expanded and contribution of nutrients, organic matter, and shade to the riverine system would be increased. The proposed action would result in a net increase of wetland extent, functions, and values.
Relevant soil properties such as compaction or percent bare ground	Downstream deposition of up to approximately 9,600 to 15,600 cubic yards of impounded sediment (including rocks/boulders) would enhance floodplain soils in the vicinity of Cascades Picnic Area. Sediment reconfiguration and site restoration and stabilization would reduce erosion and increase the protection of the river-right bank from unnatural accelerated erosion, resulting in a local, long-term, minor to moderate, beneficial impact on soils.
Relevant floodplain properties such as width, roughness, bank stability, or susceptibility to erosion	Downstream sediment deposition would enhance floodplain soils in the vicinity of Cascades Picnic Area. Sediment reconfiguration and site restoration and stabilization would reduce erosion and increase the protection of the river-right bank and adjacent roadway, resulting in a local, long-term, minor to moderate, beneficial impact on floodplain values and functions. The proposed action would have a beneficial impact on floodplain values by enhancing the free-flowing condition of the Merced River at this location, increasing available floodplain in this narrowly constricted portion of the river, and linking river-associated riparian vegetation that has been degraded and fragmented.
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER UPLAND CONDITIONS	
The position of the proposed activity relative to the uplands	The proposed action is located within the bed and banks of the Merced River. Staging for dam removal is the only activity planned for upland areas. The primary staging area would occupy a currently paved portion of Big Oak Flat Road. Traffic on this portion of the road would be diverted temporarily around the staging area through an existing paved parking area. Pohono Quarry would be used as a secondary staging area for storage of equipment used infrequently during project activities and for storage and sorting or material that would be reused within the park, recycled, or disposed outside the park.
Any likely resulting changes in:	
Vegetation composition, age structure, quantity, or vigor	There would be no measurable effect to age, vigor, quantity, structure, or composition of upland vegetation. The proposed action is located within the bed and banks of the Merced River. Staging areas are located in previously disturbed and paved areas adjacent to the river and at Pohono Quarry.

Table B-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Relevant soil properties such as compaction or percent bare ground	There would be no measurable effect to upland soil resources. Upon completion of the project (approximately five months), the existing earthen embankment, El Portal Road, and the existing paved parking area would be restored to pre-project conditions.
Relevant hydrologic properties such as drainage patterns or the character of surface and subsurface flows	There would be no measurable effect to upland hydrologic properties. No portion of the proposed action, including equipment staging, dam removal activities, or materials storage, would be located within or otherwise affect surface or subsurface drainage patterns from the uplands to the Merced River. Removal of the overflow portion of the dam and river-left abutment would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing its hydrologic integrity. At the dam site, the channel would scour to a more natural condition, becoming narrower and deeper. As this occurs, the localized water table is expected to drop and the existing narrow band of palustrine forest could transition to an upland community. Reconfiguration of impounded sediment, bank stabilization, and revegetation would minimize lateral movement of the channel and decrease erosion.
Potential changes in upland conditions that would influence archeological, cultural, or other identified significant resource values	Construction access and staging would occur on previously disturbed and paved surfaces. Dam removal would be performed in accordance with stipulations in the parkwide 1999 Programmatic Agreement and the 1986 Memorandum of Agreement. The proposed action would not influence archeological, cultural, or other identified significant resource values in uplands of the Merced River.
EVALUATE AND DESCRIBE WHETHER CHANGES IN ON-SITE CONDITIONS CAN OR WILL ALTER EXISTING HYDROLOGIC OR BIOLOGIC PROCESSES	
The ability of the channel to change course, re-occupy former segments, or inundate its floodplain	The project would restore more natural riverflow conditions in the project area. Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper – occupying a channel similar to what existed prior to dam construction. The floodplain would be enhanced by reconfiguration of impounded sediment, bank stabilization, and revegetation. No element of the proposed action would have negative long-term effects on the Merced River.
Streambank erosion potential, sediment routing and deposition, or debris loading	Removal of the dam and attendant structures (dam abutments and intake structure) would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing fluvial processes. Natural sediment transport would no longer be impeded by the dam. Reconfiguration of impounded sediment, bank stabilization, and revegetation in the area of the impoundment would minimize lateral movement of the channel and decrease erosion.
The amount or timing of flow in the channel	The flow of the Merced River would no longer be impeded by the dam. Streamflow in the vicinity of the impoundment would increase, consistent with upstream and downstream conditions.
Existing flow patterns	Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper – similar to the pre-dam channel. Free flow would be re-established along this reach of the Merced River.
Surface and subsurface flow characteristics	As the channel of the Merced River narrows and deepens, the localized water table is expected to drop, consistent with upstream and downstream conditions.
Flood storage (detention storage)	Flood storage of the Merced River in the vicinity of the impoundment would be increased. Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper.

Table B-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Aggregation and or degradation of the channel	Upon dam removal, the channel (in the area of the impoundment) would scour to a more natural condition, becoming narrower and deeper. Up to approximately 9,600 to 15,600 cubic yards of impounded sediment (including rocks/boulders) would be deposited downstream between the dam and the Cascades Picnic Area – a beneficial effect for floodplain soils and values.
Biological processes such as:	
Reproduction, vigor, growth, and/or succession of streamside vegetation	At the dam site, the channel would scour to a more natural condition, becoming narrower and deeper. As this occurs, the localized water table is expected to drop, and the existing narrow band of palustrine forests could transition to an upland community. Up to approximately 5,400 cubic yards of impounded sediment would be reconfigured on the river-right bank and stabilized with native river rock, consistent with upstream and downstream channel conditions, to provide substrate for riparian restoration. The size, connectivity, and integrity of wetlands in the project area, particularly palustrine forest and riverine habitat, would be enhanced. Palustrine forest would be expanded, and contribution of nutrients, organic matter, and shade to the riverine system would be increased. The proposed action would result in net increase of wetland extent, functions, and values.
Nutrient cycling	Nutrient cycling of riparian vegetation in the vicinity of the impoundment would be increased, due to the enhanced and expanded riparian zone on the river-right and river-left banks that would result from the drop in the localized water table and restoration along the river-right bank.
Fish spawning and/or rearing success	Removal of Cascades Diversion Dam would increase the free-flowing condition of the Merced River and return this portion of the river to a more natural condition, thereby enhancing the biological integrity of this segment for native fish and wildlife. Dam removal would alter approximately 2.5 acres of unnatural slack-water aquatic habitat upstream of the dam. At the dam site, the channel would scour to a more natural condition, becoming narrower and deeper. The island that occurs behind the dam is a natural feature of the river and is likely to remain. Water temperature through this reach would decrease, and oxygen levels would be expected to increase. Sediment deposition downstream of the dam could have short-term adverse effects on fisheries (e.g., suspended sediments would temporarily reduce dissolved oxygen levels). The application of best management practices would reduce the potential adverse impacts to fisheries to a negligible intensity. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. Sediment deposition could also have long-term beneficial effects on fisheries (sediment deposition could result in larger sandbars, creating backwater niches).
Riparian-dependent avian species needs	Riparian restoration would increase the extent, composition, and diversity of vegetation in the vicinity of the impoundment, creating riparian avian habitat of higher value compared with existing conditions.
Amphibian/mollusk needs	In-channel removal-related activities could result in short-term impacts to amphibians or mollusks at the site of the impoundment. Mitigation measures (e.g., best management practices, species-specific monitoring) would reduce the identified effects to a negligible intensity. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. Because downstream transport and deposition of impounded sediments are not expected to rise above normal background levels, the proposed action would not adversely affect species downstream of the dam. Over the long term, channel and riparian restoration would increase habitat for species of amphibians and mollusks native to the Merced River.

Table B-1 (Continued)
Section 7 Evaluation for Cascades Diversion Dam Removal Project

Evaluation Criteria	Project Data
Species composition (diversity)	Bank, floodplain, and riparian restoration would increase the extent, composition, and diversity of vegetation in the vicinity of the impoundment, creating riparian wildlife habitat of higher value compared with existing conditions.
ESTIMATE THE MAGNITUDE AND SPATIAL EXTENT OF POTENTIAL OFF-SITE CHANGES	
Consider and document:	
Changes that influence other parts of the river system	Indirect effects of the proposed action include downstream deposition of up to approximately 9,600 to 15,600 cubic yards of sands and gravels between the dam and the Cascades Picnic Area. Sediment at Cascades Picnic Area could have an approximate thickness of 0.3 to 2.1 feet. In addition, the proposed action could transport fine grained sediment to areas of low-flow energy, such as pools and downstream reservoirs. The proposed action would restore free-flow and natural fluvial processes to this reach of the Merced River. Deposition of sands and gravels in the vicinity of Cascades Picnic Area would enhance (negligible) floodplain soils. Turbidity and dissolved oxygen levels would be temporarily decreased (while sediments are in suspension), but not above normal background levels. Fine material deposited in downstream pools and reservoirs would have no perceptible effect.
The range of circumstances under which off-site changes might occur (for example, as may be related to flow frequency)	Downstream transport and deposition of impounded sediments is expected to occur during the winter or spring runoff of 2004. The positive effect of enhanced free flow would be realized immediately following dam removal.
The likelihood that predicted changes will be realized	The changes associated with the proposed action described above would be realized.
Specify processes involved, such as water and sediment, and the movement of nutrients	Natural fluvial processes such as free flow, sediment transport, and nutrient exchange would be enhanced upon completion of the proposed action.
DEFINE THE TIME SCALE OVER WHICH STEPS 3-6 ARE LIKELY TO OCCUR	
Review steps 3-6, looking independently at the element of time. Define and document the time scale over which the effects will occur.	In-channel work, bank stabilization, and revegetation would be completed within a two- to three-month period during the fall of 2003 (September through November) when the flow of the Merced River is typically lowest (less than 200 cubic feet per second). The overall project duration would be approximately five months. Natural transport of up to approximately 9,600 to 15,600 cubic yards of impounded sediment (including rocks/bounders) would be transported with high riverflows during the winter or spring of 2004. The positive effect of enhanced free flow would be realized immediately following dam removal.

Outstandingly Remarkable Values

Outstandingly Remarkable Values are the river-related values that make the river segment unique and worthy of special protection. They form the basis for the river's designation as a Wild and Scenic River. Outstandingly Remarkable Values identified for the Impoundment (3A), Gorge (3B), and El Portal (4) segments include:

- Scientific
- Scenic
- Geologic Processes/Conditions
- Recreation
- Biological
- Cultural
- Hydrologic Processes

The proposed action would include use of Pohono Quarry, located within the Valley segment, as a secondary staging area. The quarry is not located within the bed and banks of the Merced River and is currently used for staging for ongoing park operations. The proposed action includes site-specific mitigation measures and the application of best management practices and will not result in off-site impacts within the Valley segment. Therefore, the Valley segment is not included in the analysis of effects of the proposed action on Outstandingly Remarkable Values.

Effects of the Proposed Action on Outstandingly Remarkable Values

The proposed action would remove the Cascades Diversion Dam and attendant structures, restoring the free-flowing condition of the Merced Wild and Scenic River and returning this portion of the river to a more natural state, thereby enhancing its integrity. Table B-2 describes the effects of the proposed action on each of the Outstandingly Remarkable Values that apply to the Impoundment, Gorge, and El Portal river segments. As indicated in table B-1, the proposed action would have a beneficial effect on the biological and hydrologic processes Outstandingly Remarkable Values. The proposed action would not result in any changes to the current level of protection and enhancement of the scientific, scenic, geologic processes, recreation, and cultural Outstandingly Remarkable Values. As a result, the proposed action would protect the Outstandingly Remarkable Values of the Merced Wild and Scenic River.

Table B-2
Effects of the Proposed Action on Outstandingly Remarkable Values in the Impoundment, Gorge, and El Portal Segments of the Merced Wild and Scenic River Corridor

Outstandingly Remarkable Value	Effects of the Proposed Action
Scientific – The entire river corridor constitutes a highly significant scientific resource because the river watershed is largely within designated Wilderness in Yosemite National Park. Scientific Outstandingly Remarkable Values relate to the Merced River's value for research. This Outstandingly Remarkable Value applies to all the Merced River segments.	The proposed action would have no effect on scientific resources of the river. Removal of Cascades Diversion Dam would not affect the Merced River's value for research. Therefore, scientific values of the river would continue to be protected and enhanced.
Scenic – The Gorge segment provides views from the river and its banks of the Cascades, spectacular rapids among giant boulders, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock.	The proposed action would remove the dam and attendant structures from the Merced River corridor that intrude visually upon the scenic character of this area. Removal of the dam would not result in the loss of river-viewing opportunities or views of the Cascades, rapids, Wildcat Fall, Tamarack Creek Fall, the Rostrum, and Elephant Rock. The proposed action would avoid the deposition of dam debris in the river channel and the associated gouging of the riverbanks and channel, which could diminish the scenic Outstandingly Remarkable Values under the No Action Alternative. Because the dam structures do not dominate the natural landscape from any viewpoint, removal of the dam would contribute negligibly to the enhancement of the scenic Outstandingly Remarkable Value. The proposed action would continue to protect and enhance the scenic Outstandingly Remarkable Value on a segment-wide basis.
Geologic Processes/Conditions – The Impoundment segment contains the dramatic transition from the U-shaped, glaciated Yosemite Valley to the V-shaped river gorge. The Gorge segment is characterized by a classic V-shaped river gorge with a continuous steep gradient. The El Portal segment contains a transition from igneous to metasedimentary rocks (metasedimentary rocks are among the oldest in the Sierra Nevada).	The proposed action would have no effect on the geologic process Outstandingly Remarkable Value. Removal of Cascades Diversion Dam would not affect the transition from the U-shaped valley to the V-shaped river gorge, the V-shaped gorge itself, or the transition from igneous to metasedimentary rocks. These values would continue to be protected and enhanced.
Recreation – The Gorge segment provides a spectrum of river-related recreational opportunities, such a picnicking, fishing, photography, and sightseeing. The El Portal segment also provides a range of river-related recreational opportunities, in particular white-water rafting and kayaking (class III to V) and fishing.	The proposed action would remove a public safety hazard to river-related park users, including those picnicking, fishing, taking photographs, and sightseeing in the Gorge segment and those engaging in river-related recreational opportunities in the El Portal segment. The proposed action would preserve the recreational values on a segment-wide basis. Overall, the proposed action would have no net effect on the recreation Outstandingly Remarkable Value for the Gorge and El Portal segments.
Biological – The Impoundment segment contains rich riparian habitat. The Gorge segment is characterized by diverse riparian areas and associated special-status species that are largely intact and almost entirely undisturbed by humans. The El Portal segment contains riverine habitats such as riparian woodlands and associated federal and state special-status species, including Tompkin's sedge and Valley elderberry longhorn beetle and its critical habitat (elderberry shrub). Expanses of north-facing habitat allow unlimited access to the riparian zone for wildlife species.	The proposed action would have short-term, adverse, removal-related effects to approximately four acres of riparian and aquatic habitat in the Impoundment segment. Implementation of best management practices and site restoration would result in negligible effects. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. The effect would be negligible.

Table B-2 (Continued)
Effects of the Proposed Action on Outstandingly Remarkable Values in the Impoundment, Gorge, and El Portal Segments of the Merced Wild and Scenic River Corridor

Outstandingly Remarkable Value	Effects of the Proposed Action
Biological (continued)	Dam removal and implementation of best management practices and site restoration and bank stabilization would restore the free-flowing condition of the Merced River and return this portion of the river to a more natural state, thereby enhancing its biological integrity. The effect applies to the Impoundment and Gorge segments and would be long term and beneficial. Continued dam deterioration and eventual failure under the No Action Alternative could result in extensive erosion, as well as uncontrolled debris release into the Merced River that could affect downstream riparian habitat and special-status species in the Gorge and El Portal segments. The proposed action would avoid these impacts to biological resources. Overall, implementation of the proposed action would slightly increase the level of protection and enhancement of the biological Outstandingly Remarkable Values of the Impoundment, Gorge, and El Portal segments because the proposed action would have a long-term, minor to moderate, beneficial effect on the Outstandingly Remarkable Values for these segments.
Cultural – There are no cultural Outstandingly Remarkable Values in the Impoundment segment. The Gorge segment contains cultural resources, including prehistoric sites and historic sites and structures such as those relating to historic engineering projects. The El Portal segment contains some of the oldest archeological sites in the Yosemite area, as well as many historic Indian villages and traditional gathering places. River-related historic resources include structures related to early tourism and industrial development.	Although Cascades Diversion Dam is a historic resource that contributes to the cultural landscape as an element of the Yosemite Hydroelectric Power Plant, the dam is not considered an Outstandingly Remarkable Value for Wild and Scenic Rivers Act purposes because it was intended to obstruct the river's free flow. As a result, the Impoundment segment does not have any cultural Outstandingly Remarkable Values. Because the dam is not considered an Outstandingly Remarkable Value, removal of the dam would not affect the downstream cultural Outstandingly Remarkable Values in the Gorge segment. Controlled removal of the dam and bank stabilization would avoid potential downstream erosion and dam debris impacts to the Gorge and El Portal segments associated with the No Action Alternative. Further, any actions would be performed in accordance with the park's 1999 Programmatic Agreement. As a result, archeological resources throughout the remainder of the Merced River corridor would not be affected. Therefore, implementation of the proposed action would preserve archeological resources included as cultural Outstandingly Remarkable Values within the Gorge and El Portal segments. Bank stabilization and revegetation would increase bank integrity and decrease potential erosion, therefore avoiding adverse dam debris and erosion-related effects within the Gorge and El Portal segments described under the No Action Alternative. Ethnographic resources throughout the remainder of the Merced River corridor downstream of the dam would not be affected. In addition, the park would continue to consult with culturally associated American Indian tribes under this Programmatic Agreement and the cooperative agreement for traditional uses. Therefore, implementation of the proposed action would preserve ethnographic resources included as cultural Outstandingly Remarkable Values within the Gorge and El Portal segments.

Table B-2 (Continued)
Effects of the Proposed Action on Outstandingly Remarkable Values in the Impoundment, Gorge, and El Portal Segments of the Merced Wild and Scenic River Corridor

Outstandingly Remarkable Value	Effects of the Proposed Action
Cultural (Continued)	Under the proposed action, the dam would be removed in a controlled manner, compared to uncontrolled failure under the No Action Alternative. The controlled removal of the dam, performed in accordance with stipulations in the park's 1999 Programmatic Agreement, would avoid impacts to other Gorge segment cultural landscape resources, including elements of the Yosemite Hydroelectric Power Plant, the Merced Canyon Travel Corridor, and the Coulterville Stage Road. Nationally significant historic resources throughout the remainder of the Merced River corridor, such as designed landscapes and developed areas, historic buildings, and circulation systems (trails, roads, and bridges), would be unaffected, including those within the El Portal segment. Overall, implementation of the proposed action would preserve the cultural values within the Gorge and El Portal segments and would have no net effect on the cultural Outstandingly Remarkable Value for the Gorge and El Portal segments.
Hydrologic Processes – The Gorge segment is characterized by exceptionally steep gradients (2,000-foot elevation drop in approximately six miles). The El Portal segment is characterized by continuous rapids.	Dam removal activities could adversely affect water quality. This short-term effect would be reduced to a negligible intensity by the application of best management practices. Refer to the Cascades Diversion Dam Removal Project Environmental Assessment, Chapter II, Alternatives, for mitigation measures incorporated into the proposed action. Under the proposed action, Cascades Diversion Dam would be removed, thus restoring the free-flowing condition of the Merced River and returning this portion of the river to a more natural state, thereby enhancing its natural hydrologic regime. Implementation of a bioengineered bank stabilization system on the river-right bank would minimize lateral movement of the channel and decrease erosion, thereby protecting the bank, and would result a net increase in the floodplain at the site of the impoundment. Removing Cascades Diversion Dam would help restore the active flood regime and hydrologic processes. The removal of the dam would eliminate constriction of riverflow and improve the natural hydrologic regime. Implementation of the proposed action would have a long-term beneficial effect on hydrologic processes that influence river morphology. Therefore, the proposed action would protect and enhance the hydrologic processes Outstandingly Remarkable Values in the El Portal segment and would slightly increase the level of protection and enhancement of the hydrologic processes Outstandingly Remarkable Values in the Gorge segment.

Section 7 Determination

The proposed action would remove a human-made structure from the bed and banks of the Merced Wild and Scenic River. Free-flow and natural fluvial processes (e.g., sediment transport, fish passage) would be returned to a more natural condition. Upon dam removal, the channel of the Merced River would naturally narrow and deepen. The floodplain in the immediate vicinity of the impoundment would be enlarged and stabilized. Riparian and floodplain extent, functions, and values would be enhanced. The proposed action would have a beneficial effect on the biological and hydrologic processes Outstandingly Remarkable Values. The proposed action would not affect the scientific, scenic, geologic processes, recreation, and cultural Outstandingly Remarkable Values. The National Park Service concludes that the proposed action would enhance free-flow of the Merced River and would not have any direct and adverse effects on the Outstandingly Remarkable Values for which the river was designated Wild and Scenic.

Recommended:

Superintendent, Yosemite National Park Date

Approved:

Regional Director Pacific West Region, National Park Service Date